

Montana.—3d to 7th, 10th, 14th, 22d, 23d, 26th, 27th.
Nebraska.—1st, 3d to 8th, 11th, 14th, 16th, 18th, 22d, 23d, 24th, 26th, 27th, 28th, 30th, 31st.
Nevada.—4th, 14th to 18th, 20th.
New Hampshire.—1st, 5th, 12th, 13th, 21st, 22d.
New Jersey.—1st to 5th, 7th, 11th, 12th, 13th, 15th, 17th, 18th, 19th, 21st to 26th, 30th.
New Mexico.—1st, 2d, 5th, 9th, 10th, 11th, 25th, 27th, 28th, 30th, 31st.
New York.—1st to 5th, 8th to 14th, 17th to 22d, 24th, 25th, 27th, 29th, 30th, 31st.
North Carolina.—1st to 11th, 13th, 14th, 24th, 25th, 28th, 31st.
Ohio.—1st to 10th, 12th, 13th, 16th, 18th to 25th, 30th, 31st.
Oregon.—Albany, 20th.
Pennsylvania.—1st to 5th, 9th, 12th, 13th, 17th to 25th, 30th, 31st.
Rhode Island.—1st, 2d, 5th, 13th, 15th, 19th, 24th, 25th.
South Carolina.—1st, 2d, 8th, 13th, 14th, 16th, 17th, 19th, 22d, 24th, 25th, 28th.
Tennessee.—1st to 4th, 6th, 14th, 16th, 17th, 21st, 24th, 25th, 30th.
Texas.—1st, 2d, 3d, 7th to 23d, 25th to 31st.
Utah.—4th to 7th, 9th, 10th, 12th, 17th, 19th to 28th, 31st.
Vermont.—1st, 4th, 11th, 12th, 13th, 17th to 22d, 26th to 29th, 31st.
Virginia.—1st, 2d, 3d, 5th, 7th, 10th, 12th, 13th, 19th, 22d to 26th, 30th.
Washington Territory.—18th, 19th, 22d.
West Virginia.—3d, 4th, 7th, 11th, 12th, 13th, 17th, 22d, 24th, 25th.
Wisconsin.—1st to 4th, 6th to 9th, 12th, 16th, 17th, 18th, 20th, 21st, 23d, 24th, 30th.
Wyoming.—1st, 3d, 5th, 8th, 11th.

ELECTRICAL PHENOMENA.

The observer on the summit of Mount Washington, New Hampshire, reports that during a light shower of rain, which began at 11.20 p. m. on the 12th, the anemometer cups were surrounded by a halo of electric light.

The observer on the summit of Pike's Peak, Colorado, reports that during a thunder-storm on the afternoon of the 29th the atmosphere was charged with electricity to an unusual degree, and that during a fall of sleet and hail, from 7.46 to 8.20, a buzzing noise, resembling that made by bees, came from all pointed objects.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos were observed in the various states and territories as follows:

Arkansas.—Lead Hill, 10th, 16th, 22d, 26th, 29th.
California.—San Diego, 1st, 2d; San Francisco, 19th.
Dakota.—5th, 7th, 16th, 23d to 26th, 31st.
Florida.—Key West, 10th, 15th.
Georgia.—Atlanta, 12th.
Illinois.—Riley, 11th, 20th; Swanwick, 19th, 23d.
Iowa.—1st, 4th, 5th, 12th, 13th, 14th, 17th, 20th, 25th, 26th.
Kansas.—Wyandotte, 18th, 19th.
Maine.—Cornish, 3d, 21st.
Michigan.—2d, 3d, 7th, 8th, 11th, 20th, 22d, 27th, 31st.
Missouri.—Lamar, 9th; Saint Louis, 23d.
Nebraska.—Harvard, 14th, 18th; Fairbury, 18th; Tecumseh, 28th.
Nevada.—Carson City, 19th, 21st.
New Hampshire.—Mount Washington, 12th.
New York.—17th, 20th, 21st, 27th, 29th.
Ohio.—6th, 8th, 9th, 12th, 18th, 20th, 29th.
Pennsylvania.—Wellsborough, 19th; Pittsburg, 28th.
Tennessee.—Nashville, 6th, 16th, 22d, 28th, 30th.
Texas.—Fort Concho, 18th, 19th, 20th; Galveston, 20th; Indianola, 27th.
Virginia.—Dale Enterprise, 13th, 27th, 30th.
Wyoming.—Fort Bridger, 21st.

LUNAR HALOS.

Lunar halos were observed in the various states and territories as follows:

Alabama.—Mobile, 19th to 22d.
Arizona.—Wickenburg, 17th; Prescott, 16th.
California.—San Diego, 23d.
Colorado.—Montrose, 19th.
Dakota.—Bismarck and Webster, 25th.
Florida.—13th, 17th to 22d, 24th to 27th, 29th.
Georgia.—Atlanta, 19th.
Illinois.—Springfield, 23d; Riley, 26th.
Indiana.—Logansport, 23d; Vevay, 19th.
Iowa.—Davenport, 27th; Burlington, 29th.
Kansas.—14th, 18th, 21st, 25th.
Louisiana.—New Orleans, 20th.
Maryland.—Baltimore, 21st, 24th.
Massachusetts.—Milton and Readville, 29th.
Michigan.—19th, 20th, 23d, 24th, 26th.
Missouri.—Saint Louis, 24th.
Nebraska.—De Soto, 16th; Harvard, 19th.
New Hampshire.—Mount Washington, 27th.
New York.—Buffalo, 22d; Le Roy, 23d.
Ohio.—Toledo, 1st; Cleveland, 19th; Napoleon, 22d; Cincinnati, 23d.
Pennsylvania.—Wellsborough, 12th, 18th, 24th; Pittsburg, 26th.
South Carolina.—Spartanburg, 19th; Stateburg, 19th, 21st.
Tennessee.—16th, 21st, 22d, 24th, 28th, 29th, 30th.
Texas.—16th to 22d, 26th, 27th.
Utah.—Frisco, 21st.
Virginia.—7th, 13th, 16th, 18th, 22d, 23d, 27th, 28th.
Wyoming.—Fort Bridger, 21st, 23d, 26th.

The phases of the moon during August were: last quarter, 3d, 4.50 p. m.; new moon, 10th, 7.08 a. m.; first quarter, 17th, 8.41 a. m.; full moon, 25th, 12.19 p. m.; perigee, 9th, 5.18 a. m.; apogee, 21st, 12.54 p. m.

MIRAGE.

Mirage was observed at the following stations during the month:

Salina, Kansas, 16th.
 Maud, Kansas, 22d, 23d.
 Reidsville, North Carolina, 10th.
 Indianola, Texas, 28th.

MISCELLANEOUS PHENOMENA.

SUN SPOTS.

Prof. David P. Todd, director of the Lawrence Observatory, Amherst, Massachusetts, furnishes the following record of sun spots for August, 1885:

Date— August, 1885.	No. of new.		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
4, 5 p. m.	1	1	.....	.....	1	1	3	25†	
6, 6 p. m.	0	3†	0	0	.....	.....	3	30†	
8, 5 p. m.	4	40†	.....	.....	.....	.....	7	70†	
9, 5 p. m.	1	23†	0	0	1	3	6	90†	
11, 3 p. m.	0	0	.....	.....	0	0	4	80†	
14, 3 p. m.	.....	.....	.....	.....	.....	.....	5	55†	
15, 6 p. m.	0	0	0	5†	0	0	5	50†	
16, 4 p. m.	0	0	0	5†	0	0	5	35†	
17, 4 p. m.	0	0	1	5†	0	0	4	20†	
20, 7 a. m.	0	0	0	0	0	0	4	20†	
22, 4 p. m.	1	2	.....	.....	1	2	3	15†	
29, 11 a. m.	.....	.....	.....	.....	.....	.....	3	40†	
27, 12 m.	0	0	0	0	0	0	3	45†	
28, 12 m.	2	7	0	0	1	5	5	55†	
30, 3 p. m.	0	20†	.....	.....	.....	.....	4	75†	
31, 9 a. m.	1	20†	1	5†	0	0	4	90†	

Faculae were seen at the time of every observation.

† Approximated.

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from one hundred and sixty-five stations show 5,025 observations to have been made, of which four were reported doubtful; of the re-

mainder, 5,021, there were 4,230, or 84.2 per cent., followed by the expected weather.

The following notes, concerning the sun-glows during August, have been reported:

Albany, Oregon: beautiful, bright after-glows were observed on the 2d, 3d, 4th, 6th, 7th.

Wellington, Kansas: prominent sunset after-glows were noted on the evenings of the 7th, 8th, 16th, 27th, 29th.

Sterling, Kansas: bright sun-glows were observed at intervals during the month.

Vevay, Indiana: yellow or orange sunsets were observed on the 1st, 5th, 13th, 15th, 17th, 20th, 28th, 30th; rosy sunsets were observed on the 3d, 8th, 9th, 10th, 16th.

Sunman, Indiana: the brilliant sunsets of 1883 and 1884 reappeared during August; they were noted on the following dates: 9th, 10th, 14th, 15th.

Logansport, Indiana: the western horizon was brilliantly illuminated with yellow, orange, and pink hues on the evenings of the 25th and 27th.

Dale Enterprise, Virginia: the bright sun glows of last year reappeared during the last week in August.

DROUGHT.

Charleston, Illinois: the month opened with drought prevailing; on the 2d it was relieved by an abundant rain.

Mahanoy Plane, Schuylkill county, Pennsylvania: the rain storm which occurred on the afternoon of the 1st ended a severe drought in this vicinity. At some of the collieries water had to be hauled several miles.

Indianola, Texas, 1st: rain is much needed in this part of the state.

Lamar, Missouri, 9th: corn and other crops in this vicinity are suffering from drought.

Atkins, Pope county, Arkansas, 10th: hot and dry weather prevails in the Arkansas Valley from Fort Smith to Little Rock, and is seriously injuring the crops.

Palestine, Texas, 11th: rain is much needed in this vicinity; pastures are badly burned and many wells have failed; the cotton crop is also suffering.

Galveston, Texas, 14th: reports from nearly every part of the state indicate that drought has caused considerable damage to the cotton crop during the last ten days.

Marianna, Lee county, Arkansas, 20th: but little rain has fallen in this part of the state during the last thirty days, and corn and cotton are suffering in consequence.

Bowie, Montague county, Texas, 20th: during the past seven weeks but little rain has fallen in this locality. The cotton crop in this and adjoining counties has been seriously injured.

Dale Enterprise, Rockingham county, Virginia: drought prevailed in this part of the state throughout August. The water-supply for milling purposes was insufficient, and the pastures were dry and parched.

Nashville, Tennessee: at the close of the month severe drought prevailed in this vicinity. The rainfall for the month was but 1.02 inches, which is less than one-third of the average rainfall for August.

Wellington, Sumner county, Kansas: the dry weather during August prevented the maturing of crops. Ploughing, for seeding autumn wheat, has been delayed on account of the dryness of the soil.

Westmoreland, Pottawottomie county, Kansas: August was a hot month, with but little rainfall, which was very unevenly distributed. In some localities crops have been injured by drought.

East Portland, Oregon: no rain fell at this place during the month of August.

Bainbridge Island, Washington Territory, 30th: gardens have been seriously injured by drought.

EARTHQUAKES.

The Charleston (South Carolina) "News and Courier" of August 21, 1885, contained the following:

RALEIGH, N. C., Aug. 20.—There were violent shocks of earthquake last

Thursday in the Blue Ridge Mountains in Watauga county. At first there were noises like thunderclaps, while the sky was cloudless, then the earth shook, and terrible noises were heard. These were felt for many miles, at the height of 4,100 feet, and in Grandfather Mountains, 6,000 feet; people were frightened so that they fled. The noises and shocks were felt at Boone.

Garrettsville, Portage county, Ohio: a severe shock, which is supposed to have been due to an earthquake, was experienced at 11.05 p. m. on the 14th.

The following is an extract from "Science," of August 28, 1885:

The schooner "Rosario," at New York, reports that on June 23d, in lat. 29° 14' N., long. 133° 35' W., at 11 a. m., two heavy shocks of submarine earthquake were experienced. These were about one minute apart; and the last was much heavier than the first, causing the vessel to tremble violently. The sky was overcast and the sea remarkably smooth.

FOREST AND PRAIRIE FIRES.

Santa Rosa, California: the mountains in this vicinity were almost obscured by smoke from forest fires on the 31st.

Pleasant Grove, Washington Territory: during the month the atmosphere in this region has been filled with smoke from forest fires.

Tacoma, Washington Territory: forest fires have prevailed during the entire month in this region, rendering navigation on the Sound difficult, and to some extent dangerous.

Albany, Oregon, 8th, 9th.

Fort Concho, Texas, 13th.

Fort Maginnis, Montana, 15th, 16th.

San Diego, California, 17th.

Los Angeles, California, 19th.

Fort Yates, Dakota, 23d to 26th.

Linkville, Oregon, 24th.

INSECTS.

Fort Buford, Dakota, 26th: locusts have gradually disappeared from this part of the country. The grain fields were not injured, but pastures were to some extent damaged.

Rochester, New York: an immense swarm of butterflies was observed on the 26th, approaching "Windsor Beach" from over the lake. When some distance from the shore it resembled a dark cloud and upon reaching "Windsor Beach" all objects were covered with them.

Poplar River, Montana, 30th: locusts have almost entirely disappeared; they have, apparently, migrated eastward.

Muscataine, Muscatine county, Iowa, 31st: grasshoppers have been quite destructive to crops in this part of the state during the month.

Wauseon, Fulton county, Ohio, 31st: grasshoppers were quite numerous during the month, and caused considerable injury to corn and oats in this county.

Fort Madison, Lee county, Iowa, 31st: grasshoppers have been very destructive during the month, especially to late corn, meadows, and gardens.

METEORS.

Little Rock, Arkansas, 3d: five meteors were observed between 9.30 and 10 p. m.

Nashville, Tennessee: numerous small meteors were observed from 8.40 p. m. on the 4th until daylight on the 5th; they were observed at intervals of from five to twenty seconds.

Mount Washington, New Hampshire, 8th: from 9.30 to 10 p. m. a meteoric display was observed; three or four meteors per minute were observed for thirty minutes.

Dover, New Jersey, 8th: during the evening a large and bright meteor was observed in the east at an altitude of 75°; it moved westward a few degrees and then disappeared, leaving a brilliant trail which remained visible for several seconds.

Concordia, Kansas, 9th: at 9.45 p. m. a large and brilliant meteor, of yellowish color, was observed shooting across the sky from northwest to southeast; about one minute after its disappearance a loud report, like that of a cannon, was heard.

Riley, Illinois, 10th: numerous bright meteors were observed at about 9.15 p. m.

Smithville, North Carolina, 10th: from 9.30 to 10 p. m.

twelve meteors were observed, all moving from the northeast in a southwesterly direction.

Fort Myer, Virginia, 10th: from 8 to 11 p. m. a large number of meteors were seen; at 11 p. m. two very brilliant meteors were noted.

Wellington, Kansas: during the night of the 10-11th a large number of meteors were observed; in two hours fifty-five were counted, each one diverging from the north and pursuing a southerly course.

Muscataine, Iowa, 11th: at about 2 a. m. fifteen meteors were observed in ten minutes, all going south.

Beverly, New Jersey, 11th: three meteors were observed between 8 and 9 p. m.

Columbus, Ohio, 11th: a large number of meteors were observed during the evening.

Rio Grande City, Texas, 14th: a large number of small meteors were observed during the night. A large and brilliant one was seen at 10.25 p. m.; it started from a point about 4° east of the zenith, and fell slowly southward to within 20° of the horizon, where it disappeared. Its flight was of about three seconds' duration.

Lead Hill, Arkansas, 14th: at about 8 p. m. a large and bright meteor was seen in the northeast; it was visible about three seconds and produced a bright light resembling a flash of lightning.

Meteors were also observed in the various states and territories as follows:

Alabama.—Green Springs, 10th, 11th.
Arizona.—Fort Grant, 15th.
Arkansas.—Little Rock, 9th; Lead Hill, 8th, 10th, 11th.
California.—Princeton, 7th to 13th, frequent.
Connecticut.—New Haven, 5th; Bethel, 8th to 11th.
Dakota.—Webster, 9th.
Florida.—Limona, 2d, 3d, 5th to 10th, numerous; Manatee, 4th, 8th.
Illinois.—Swanwick, 1st; Riley, 4th; Charleston, 5th, 9th, 14th, 27th; Wilton Centre, 10th, numerous; Cairo, 15th.
Indiana.—Terre Haute, 5th, 8th, 11th, numerous; Logansport, 7th, 10th; Vevay, 10th, 11th, 13th.
Iowa.—Davenport, 4th, 10th; Dubuque and Muscatine, 10th; Burlington, 14th, 15th.
Kansas.—Salina, 3d, 7th, 8th, 12th, 28th; Allison, 5th, 6th, 9th to 13th, 16th, 27th.
Kentucky.—Richmond, 14th.
Maine.—Eastport, 7th; Buckfield, 11th.
Maryland.—Woodstock, 3d, 5th, 10th, 11th.
Massachusetts.—Taunton, 4th, 8th, 11th, 12th, 21st; Fall River, 9th to 11th, numerous; Milton, 12th; Rowe, 20th.
Michigan.—Lansing, 10th.
Minnesota.—Rochester, 9th.
Nebraska.—Harvard, daily from 7th to 20th; Genoa, 9th, 12th; Crete, 10th.
New York.—Factoryville, 8th; Le Roy, 10th, 11th; Ithaca, 20th.

Ohio.—Cincinnati, 6th; Hiram, 10th.
Oregon.—Albany, 10th, 11th.
Pennsylvania.—Quakertown, 10th.
South Carolina.—Stateburg, 3d, 8th, 9th, 10th.
Tennessee.—Nashville, 4th, 5th, 9th.
Texas.—Cleburne, 6th, 8th, 9th, 10th; Fort Concho, 8th; Brownsville, 9th.
Utah.—Nephi, 9th, 10th.
Vermont.—Woodstock, 8th.
Virginia.—Chincoteague, 9th, 10th, 12th; Dale Enterprise, 9th, 13th; Fort Myer, 10th; Wytheville, 10th, 20th.
Wisconsin.—Beloit, 10th; Madison, numerous meteors were observed during the first half of the month.

MIGRATION OF BIRDS.

Geese flying southward.—Portland, Oregon, 27th, the first seen this season; geese were also seen in large numbers on the 30th.

Ducks flying northward.—Harvard, Nebraska, 12th.
Ducks flying southward.—Harvard, Nebraska, 12th; Poplar River, Montana, 7th.

Cranes flying southward.—Nephi, Utah, 11th.

POLAR BANDS.

Dale Enterprise, Virginia, 1st, 19th, 27th.
 Clear Lake, Arkansas, 16th, 17th, 18th.
 Montrose, Colorado, 4th, 18th.
 Riley, Illinois, 1st, 20th, 22d, 31st.
 Salina, Kansas, 12th, 15th, 16th, 23d, 29th.
 Gardiner, Maine, 28th.
 Somerset, Massachusetts, 14th, 15th.
 Amherst, Massachusetts, 26th.
 Escanaba, Michigan, 1st.
 Mountainville, New York, 29th.
 Wauseon, Ohio, 16th.
 Nashville, Tennessee, 16th, 17th.
 Rio Grande City, Texas, 3d, 12th, 13th, 21st, 24th, 26th.
 Wytheville, Virginia, 26th.

SAND STORMS.

Wickenburg, Arizona, 5th, 6th, 19th.
 Fort McDowell, Arizona, 4th, 15th.
 Maricopa, Arizona, 10th.
 San Diego, California, 18th.
 Los Angeles, California, 18th, 19th.
 Point Pleasant, Louisiana, 10th.

WATER-SPOUTS.

The British schooner "Mary Jane," at Yarmouth, Nova Scotia, on the 18th, from the West Indies, reports having observed, on the 9th, in N. 36° 30', W. 65° 45', a large water-spout, which remained visible for thirty minutes.

The s. s. "Valencia," M. Santamarina, commanding, passed a water-spout, on the 19th, when in N. 27° 44', W. 47° 22'.

The British s. s. "Manitoba" on the 29th, at 2.30 p. m., in N. 51° 11', W. 58° 53', observed a well-defined water-spout.

ERRATA.

On page 168, in the REVIEW for July, 1885, in the table giving the average velocity, etc., for the "Areas of low barometer," the heading for the sixth column should read "10 p. m. to 7 a. m." (not 11 p. m. to 7 a. m.), and that for the eighth column should read "3 p. m. to 10 p. m." (not 3 p. m. to 11 p. m.).

In the August REVIEW, page 182, under "Verifications," the percentage of special indications verified at Buffalo, New York, given as 81.45, should read 97.0.

Meteorological record of voluntary observers and Army post surgeons, August, 1885.

The maximum and minimum temperatures at stations marked thus (*) are from readings of other than standard instruments.

Stations.	Temperature.					Stations.	Temperature.				
	Maximum.	Minimum.	Mean.	Rainfall.			Maximum.	Minimum.	Mean.	Rainfall.	
<i>Alabama.</i>	0	0	0	Inches		<i>California—Cont'd.</i>	0	0	0	Inches	
Greensborough *.....	96	65	80.2	2.23		Presidio of San F.....	83	48	57.5	0.00	
Mount Vernon B'ks.....	99	61	80.9	4.20		Princeton *.....	109	54	79.0	0.00	
<i>Arizona.</i>						Ross Valley *.....	101	41			
Fort McDowell.....	116	67	91.7	0.56		Sacramento *.....	102	50	71.5	0.00	
Tucson.....				1.76		Salinas *.....	76	52	54.9	0.00	
<i>Arkansas.</i>						Santa Rosa *.....	92	51	62.7	0.00	
Lead Hill *.....	104	53	78.4	4.14		<i>Colorado.</i>					
Mount Ida *.....	95	56	73.3	1.90		Braddock.....	81	22			
<i>California.</i>						Lyon, Fort.....	102	54	76.8	1.85	
Alcatraz Island.....	70	49	55.9	0.00		Pueblo.....	95	55	71.1	4.62	
Angel Island.....	84	50	60.1	0.00		<i>Connecticut.</i>					
Benicia Barracks.....	98	53	67.2	trace		Bethel.....				5.80	
Bidwell, Fort.....	94	53	72.1	trace		Hartford.....	88	41	65.7	8.84	
Blue Lake.....	96	45	64.6	0.00		North Colebrook *.....	87	49	67.5	5.78	
Cahuenga Valley *.....	105					North Stamford *.....	86	52	67.6		
College City *.....	114	48	79.8	trace		Voluntown *.....	90	50		6.55	
Fall Brook *.....	115	60	72.5	0.02		<i>Dakota.</i>					
Gaston, Fort.....	108	45	72.0	trace		Abr. Lincoln, Fort.....	96	38	63.9	2.50	
Mason, Fort.....	80	50	58.9	0.00		Buford, Fort.....	91	33	63.5	1.53	
Murieta *.....	111		75.8	0.70		Meade, Fort.....	95	40	65.1	3.22	
Oakland *.....	85	53	61.0	0.00		Pembina, Fort.....	90	27	59.9	1.20	
Oroville *.....	102	63	82.1	0.00		Randall, Fort.....	91	39	67.9	5.17	
Poway *.....	103	64	75.8	trace		Richardtown *.....	94	42	61.6	2.80	